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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,741	09/30/2004	Setsuo Omoto	2004-1468A	9829
513 7590 06/14/2006 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER HANDAL, KAITLY V	
			ART UNIT 1764	PAPER NUMBER

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/509,741	Applicant(s) OMOTO ET AL.	
	Examiner Kaity Handal	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
 4a) Of the above claim(s) 10-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) 1 is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/30/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-9, drawn to apparatus.

Group II, claim(s) 10-28, drawn to a method.

The inventions listed as Groups II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I does not require the special feature of stopping the operation in order to purge the reforming device.

During a telephone conversation with Mr. Nils Pederson on 5/23/2006 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

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remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Analysis

It is noted that claims 1-9 recite a "system" which is not a statutory category of invention. It has been determined that the claims are directed to an apparatus and the appropriate principles for interpreting claims for that particular category of invention have been applied.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Amemiya et al. (US 5,248,567).

With respect to claims 1 and 5, Amemiya teaches a fuel cell power generation system equipped with a fuel reforming device and a fuel cell body, comprising: raw gas feeding means (fig. 7, 22c) for feeding into said fuel reforming device (as illustrated in fig. 7) exhaust gas discharged from a heating burner (26) of said fuel reforming device, and inert gas formation means (31) including an oxidizable and reducible oxygen adsorbent which adsorbs oxygen in said raw gas to remove oxygen from said raw gas and generate an inert gas (col. 11, lines 49-68).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amemiya et al. (US 5,248,567), as applied to claim 1 above, and further in view of Hirota et al. (US 3,944,650).

With respect to claims 2 and 6, Amemiya discloses all claim limitations as set forth above but fails to show wherein said fuel cell power generation system is characterized by having an adsorbent reduction means/(solution of sodium sulfite (Na_2SO_3)) for reducing said oxygen adsorbent which has adsorbed oxygen. Hirota teaches a process for removing oxides from combustion waste gas wherein an adsorbent/sodium sulfite (Na_2SO_3) has a reducing means/contacted with oxygen for reducing said oxygen adsorbent/sodium sulfite (Na_2SO_3) which has adsorbed oxygen in order to recover sodium sulfate (col. 2, lines 20-31).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have an adsorbent reduction means for reducing said oxygen adsorbent which has adsorbed oxygen in Amemiya's apparatus, as taught by Hirota, in order to recover sodium sulfate.

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6. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amemiya et al. (US 5,248,567), as applied to claim 1 above, and further in view of Struthers (US 2002/0110712 A1).

With respect to claims 3-4, Amemiya teaches wherein said oxygen adsorbent (fig. 8, 31) comprised of manganese is disposed in a location downstream a reformer (24) but fails to show wherein the oxygen adsorber is in a location between a reforming catalyst layer and a CO conversion catalyst layer or upstream of reforming catalyst. Struthers teaches a hydrogen generator system (fig. 1) comprising a manganese adsorbent (20) (which would therefore adsorb oxygen) located upstream a reforming catalyst (21) in order to absorb elemental sulfur compounds (page 5, paragraph [0084]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to dispose the oxygen adsorber is in a location upstream of reforming catalyst and comprised of manganese in Amemiya's apparatus, as taught by Struthers, in order to absorb elemental sulfur compounds.

7. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima et al. (US 2002/0024038 A1) in view of Prasad et al. (US 6,153,163) and further in view of Roychowdhury (US 2003/0205458 A1).

With respect to claim 7, Iijima teaches a system comprising: a fuel reforming system (10), a carbon dioxide recovery means (51₁) fed with raw gas including a reformed gas formed by reforming in said fuel reforming device (10) to absorb

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carbon dioxide from said raw gas; and a carbon dioxide feeding means/convection portion (13) adapted to heat said carbon dioxide recovery means (51₁ and 51₂), thereby releasing carbon dioxide and feeding it (via 20₆) into said fuel reforming device (10).

Iijima fails to show wherein carbon dioxide is removed using an amine solution. Prasad teaches a membrane reformer having a carbon dioxide removal means (fig. 7, 68d) comprising amine process equipment in order to recover carbon dioxide (col. 12, lines 44-55) and utilize it as an oxygen source in reforming (col. 12, lines 4-7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to remove carbon dioxide using an amine solution in Iijima's apparatus, as taught by Prasad, in order to recover carbon dioxide and utilize it as an oxygen source in reforming.

With respect to claim 8, Iijima teaches further wherein system comprises a raw gas recycling means (20₉) for supplying said raw gas from which carbon dioxide has been recovered by said carbon dioxide recovery means (51₂), to said burner/combustion radiation portion (12) of said fuel reforming device (10).

With respect to claim 9, Iijima as modified discloses all claim limitations as set forth above, he further teaches wherein his apparatus comprises a moisture recovery means (20₁₁) for recovering moisture/water from said carbon dioxide fed into said fuel reforming device (10). Iijima as modified fails to show a moisture recycling means for returning said moisture, which has been recovered by said moisture recovery means, to said aqueous amine solution of said carbon dioxide

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recovery means. Roychowdhury teaches a hydrogen production apparatus comprising a carbon dioxide separator (fig. 13) within a suitable medium as water or a hindered amine in order to separate carbon dioxide (page 6, paragraph [0072]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to recycle the recovered moisture to said aqueous amine solution of said carbon dioxide recovery means in Iijima's modified apparatus, as taught by Roychowdhury, in order to separate carbon dioxide.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

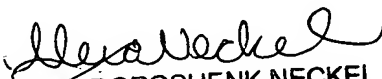
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KH



6/5/2006


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER